

Mod 1 Inc
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 25X1

October 4, 1961

Dear Sir:

This letter confirms the discussions between our personnel (Dick and Glen) and you and your associates on September 28-29, 1961, regarding appropriate solutions to the problem of excessive dust emission from the (Model 1 incinerator installed in Washington, D. C.)

As you know, the Model 1 incinerator is an air-cooled incinerator with the inherent characteristic that nearly all of the clay-type ash contained in the paper plus a small amount of the charred paper particles flows out of the combustion chamber with the flue gases. In view of the mode of operation of the incinerator at this particular site, excessively high burning rates have been achieved. The difficulty which confronts you stems from the greatly aggravated emissions of ash and char that have occurred during operation at these extremely high burning rates. We feel that the nuisance can be satisfactorily eliminated by collecting almost all of this dusty material in commercially available equipment and by discharging the remainder at an elevation such that the extremely fine particles would be dispersed innocuously.

We have considered two basic solutions which can be expected to reduce the amount of dust emitted to the order of roughly one-sixth to one-twelfth the amount presently emitted. They involve:

(1) A stainless steel, commercially built cyclone

separator with appropriate stainless steel piping.

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DOC 85	REV DATE 7 July 80	BY 052447
ORIG COMP 056	OPI 56	TYPE 01
ORIG CLASS 4	PAGES 4	REV CLASS C
JUST 22	NEXT REV 20/0	AUTH: HR 70-2

ORIGINAL CL BY 23 59 79
☐ DECL ☒ REVW ON 07/07/2010
 EXT BYND 6 YRS BY SAME
 REASON 3 d (3)

CONFIDENTIAL

-2-

CONFIDENTIAL October 4, 1961

- (2) A stainless steel, commercially built water scrubber preceded by an appropriate stainless steel, water-spray quenching section and appropriate piping.

These are discussed below, along with the subjects of appropriate stack and probable costs.

Cyclone Separator

A stainless steel cyclone considered applicable to this problem would have to handle hot gases at the rate of about 11,000 lb/hr at 1800 F, maximum. The pressure drop under the above conditions should be approximately 3 in. of water.

Such a cyclone would not need an additional gas-handling blower because the present blower on the incinerator has reserve sufficient to overcome the additional resistance. We recommend that the fine dust accumulated in the cyclone-separator hopper be flushed with water into a sump or sewer, to avoid a dust nuisance when the hopper is unloaded.

Scrubber

If a scrubber is used, we feel that it should be made of stainless steel, to minimize difficulties stemming from corrosion. In such an application, the scrubber should be preceded by a stainless steel duct including water sprays arranged suitably and supplied with sufficient water, thoroughly

CONFIDENTIAL

-3-

October 4, 1961

CONFIDENTIAL

atomized, so as to reduce the temperature of the gases (11,000 lb/hr) from 1800 F to 400 F before they enter the scrubber.

In connection with the scrubber, an induced-draft blower would have to be used to overcome the resistance of the scrubber. However, during loading of the incinerator, this blower would cause too much air to be sucked into the incinerator through the open door. Hence, some type of interlocking control should be provided that would connect the charging door with a damper on the scrubber discharge, to reduce the air flowing into the open charging door during loading.

The scrubber and all of the water piping must be arranged to permit ready draining. This will prevent freezing when the unit is not being used during the winter period.

Stack

Whether the cyclone separator or the scrubber is used, the present Van Packer stack or a stainless steel equivalent should be extended, suitably braced, to the same height as the adjacent brick stack. This is to assure free and unimpeded dispersion of the residual plume.

Estimated Costs

We estimate that the cost of a suitable commercial cyclone separator will be approximately \$2,500. The purchase and installation of such a cyclone, with the above-suggested taller stack and associated connecting ducts, will involve an estimated total cost of about \$6,000.

CONFIDENTIAL

-4-

CONFIDENTIAL

October 4, 1961

Similarly, we estimate that to purchase and install an appropriate commercial scrubber suitably connected and controlled, and with a taller stack, will cost about \$12,000 total.

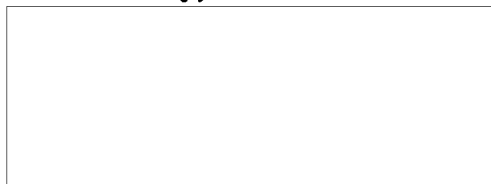
It is emphasized that these costs represent "ball park" estimates, and should be checked against the totals of estimates obtained from equipment manufacturers and installers.

Figures 1 and 2 are sketches showing possible arrangements for the cyclone and the scrubber.

As was discussed during the above-mentioned visit to Washington, whatever the solution, at present the elbow in the exhaust system is located too close to the incinerator. The exhaust pipe from the unit should go straight through the roof before turning toward the stack. Also, the portion of the pipe within the building should be surrounded by a well-ventilated radiation shield.

If we can be of any help in the further consideration of this problem or of its solution, please do not hesitate to call upon us.

Sincerely,



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ABW:mlm

In Duplicate

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